DATA EVALUATION RECORD

TRIMETHYLAMINE
(Bull Run Fly Attractant)

STUDY TYPE: Waiver Requests for Mammalian Toxicity Testing Requirements

MRID 47396933

Prepared for
Biopesticides and Pollution Prevention Division
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U.S. Environmental Protection Agency
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Task Order No. 08-031

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DATA EVALUATION RECORD

EPA Secondary Reviewer:

STUDY TYPE:	Waiver Requests for Mammalian Toxicity Testing Requirements
MRID NO:	47396933
DECISION NO:	392213
DP BARCODE:	DP353134
TEST MATERIAL:	Trimethylamine
PROJECT STUDY NO:	Not applicable
SPONSOR:	Bull Run Scientific, VBT, 7400 Beaufont Springs Drive, Suite 300, Richmond, VA 23225-5519
TESTING FACILITY:	Not applicable
TITLE OF REPORT:	Trimethylamine: Tier I Mammalian Toxicology
AUTHOR:	Smith, C.A.
STUDY COMPLETED:	April 2, 2008
CONFIDENTIALITY CLAIMS:	None
GOOD LABORATORY PRACTICE:	A signed and dated GLP statement was included. The study is descriptive in nature, and not subject to the requirements of 40 CFR Part 160.
CONCLUSION:	The information provided is sufficient to grant the requested waivers for the requirements of Acute Oral Toxicity, Acute Dermal Toxicity, Acute Inhalation Toxicity, Acute Eye Irritation, Acute Dermal Irritation, Dermal Sensitization, Hypersensitivity Incidents, 90-Day Inhalation Toxicity, Prenatal Development, Bacterial Reverse Mutation Assay, *In vitro* Mammalian Cell Assay, and *In vitro* Mammalian Chromosome Aberration testing for trimethylamine.

Test Material

Trimethylamine (present at 2.8% w/w in Bull Run Fly Attractant)

Product Description

Bull Run Fly Attractant is an end use product to be used as an attractant for "filth flies" such as house flies, blow flies, bottle flies, lesser house flies, cluster flies, lance flies, secondary screwworm flies, flesh flies, and false stable flies. The product is composed of a fly attractant mix (97.3% w/w) in a [redacted]
Trimethylamine is present in the product a concentration of 2.8%. The pouch of attractant is contained in a disposable or reusable trap that is filled with the appropriate amount of water and hung in the treatment area.

Waiver Request

The registrant is requesting waivers for the following requirements:

Acute Oral Toxicity	(OPPTS 870.1100)
Acute Dermal Toxicity	(OPPTS 870.1200)
Acute Inhalation Toxicity	(OPPTS 870.1300)
Acute Eye Irritation	(OPPTS 870.2400)
Acute Dermal Irritation	(OPPTS 870.2500)
Dermal Sensitization	(OPPTS 870.2600)
Hypersensitivity Incidents	(OPPTS 885.3400)
90-Day Inhalation Toxicity	(OPPTS 870.3465)
Prenatal Development	(OPPTS 870.3700)
Bacterial Reverse Mutation Assay	(OPPTS 870.5100)
In vitro Mammalian Cell Assay	(OPPTS 870.5300)
In vitro Mammalian Chromosome Aberration	(OPPTS 870.5375)

Registrant's Justification

Trimethylamine occurs naturally as a product of decomposition of plants and animals. It is mainly responsible for the fish odor associated with fouling fish and bad breath.

Trimethylamine is generally regarded as safe at a level of 0.10 ppm in soups (Hall and Oser, undated).

Bull Run Fly Attractant is packaged in unit doses. The largest proposed net weight for the attractant is 69.97 g. Since the attractant nominally contains 2.8% trimethylamine, the largest proposed package size of the product would contain 1.96 g of trimethylamine.

Acute Oral Toxicity

According to the OSHA MSDS, the acute oral LD_{50} for trimethylamine in rats is 500 mg/kg.

Acute Dermal Toxicity

Bull Run Fly Attractant is packaged in a water soluble pouch. Since the attractant is contained in the pouch, no significant dermal exposure to the attractant is anticipated. The label directs the user to wash his/her hands after handling the trap or attractant. Trimethylamine smells like decaying fish; if a person were to get trimethylamine on his/her skin or clothing, the person would be aware of it and remove soiled clothing and wash contaminated skin. Although the product label does not require the use of PPE, it is customary for persons working around livestock to wear rubber boots and gloves.

Acute Inhalation Toxicity

According to a study cited by the OSHA MSDS for trimethylamine, the "approximate lethal concentration" of trimethylamine in rats was 3500 ppm for a 4-hour exposure (ACGIH, 1991).

In another study cited by the OSHA MSDS, rats were exposed to 0, 75, 250, or 750 ppm trimethylamine for 6 hours/day, 5 days/week, for 2 weeks (ACGIH, 1991). After the 10 exposures, a dose-dependent degeneration in nasal and respiratory mucosa was observed. In addition, the 750 ppm group had depressed growth, dehydration, increased pulmonary and cardiac weights, and decreased spleen and thymus weights. All pathological effects except the degeneration of the nasal mucosa had resolved by the end the 2-week recovery period.

According to the OSHA MSDS, trimethylamine is a sensory irritant, causing a 50% reduction in the respiratory rate of mice at a concentration of 61 ppm (ACGIH, 1991).

Acute Eye Irritation

According to the OSHA MSDS, aqueous solutions of trimethylamine can be irritating to the eye. A 1% solution caused severe irritation, a 5% solution caused hemorrhagic conjunctivitis, and a 16.5% solution caused severe reactions with conjunctival hemorrhages, corneal edema, and opacities (Grant, 1986). Trimethylamine is corrosive to the eye and skin of humans (ACGIH, 1991). A blast of trimethylamine vapor has caused epithelial sloughing in the eye, which healed promptly (Grant, 1986).

Acute Dermal Irritation

According the OSHA MSDS, trimethylene is corrosive to the eye and skin of humans (ACGIH, 1991). A concentrated aqueous solution of trimethylamine applied to intact human skin caused severe burning and hyperemia. Petechial hemorrhages were observed after 1 to 2 hours and slight desquamation was observed 2 to 3 hours later.

Dermal Sensitization

No significant repeated dermal exposure to trimethylamine associated with the use of Bull Run Fly Attractant is anticipated. The attractant is packaged in a water-soluble pouch that is not to be opened by the user. The trap opening into which the water is added to dissolve the pouch containing the attractant is small in proportion to the overall trap size. Since the attractant suspension is not sprayed, there will be no spray drift onto the user's skin or clothing. During manufacture of the product, workers are protected by engineering controls and the appropriate PPE.

Hypersensitivity Incidents

The registrant is not aware of any hypersensitivity incidents associated with trimethylamine. Should the registrant become aware of hypersensitivity incidents, they will be reported to the Agency.

90-Day Inhalation Toxicity

Assuming the maximum label use rate of 48 traps/acre, and a simultaneous and instantaneous release of 100% of the trimethylamine from the traps into a volume of air 10 feet high in one acre, the resulting trimethylamine concentration would be 7.6×10^{-6} mg/L of air:

(48 traps/acre) x (69.97 g attractant/trap) x (2.8 g trimethylamine/100 g attractant) = 94 g trimethylamine/acre

(43,560 ft^2/acre) x (10 ft) = 435,600 ft^3

(435,600 ft^3) x (0.0283 m^3/ft^3) x (1,000,000 cm^3/m^3) x (1 L/1000 cm^3) = 1.233×10^{10} L of air

94 g trimethylamine/1.233×10^{10} L of air = 7.6×10^{-9} g trimethylamine/L of air = 7.6×10^{-6} mg trimethylamine/L of air.

This calculation is a worst-case assessment; in a realistic case, the trimethylamine would be released over time and be dissipated by wind. Therefore, there is no significant inhalation exposure to trimethylamine from the use of Bull Run Fly Attractant. During production of the product, there is no significant worker exposure to trimethylamine due to engineering controls and the use of appropriate PPE.

Prenatal Development

No significant exposure to trimethylamine is anticipated from the use of Bull Run Fly Attractant. The attractant is packaged in a water-soluble pouch that is not to be opened by the user. The trap opening into which the water is added to dissolve the pouch containing the attractant is small in proportion to the overall trap size. Since the attractant suspension is not sprayed, there will be no spray drift onto the user's skin or clothing. During manufacture of the product, workers are protected by engineering controls and the appropriate PPE.

Bacterial Reverse Mutation Assay

According to the OSHA MSDS, trimethylamine was not mutagenic in the Ames assay in the presence or absence of metabolic activation (ACGIH, 1991).

In a standard Salmonella/microsome preincubation assay, trimethylamine was tested in strains TA1535, TA 1537, TA97, TA98, and TA100 in the presence and absence of rat or hamster liver S-9. Trimethylamine was negative at doses of 0.10, 0.33, 0.10, 0.33, and 1.0 mg/plate (Mortelmans, et al., 1986, cited in TOXNET, 2008).

In vitro Mammalian Cell Assay/*In vitro* Mammalian Chromosome Aberration

No significant oral, dermal, or inhalation exposure to trimethylamine is anticipated from the use or production of Bull Run Fly Attractant, and trimethylamine is not mutagenic in the Ames test.

Reviewer's Comments

The reviewer believes that sufficient information was provided to grant the requested waivers for Acute Oral Toxicity, Acute Dermal Toxicity, Acute Inhalation Toxicity, Acute Eye Irritation, Acute Dermal Irritation, Dermal Sensitization, Hypersensitivity Incidents, 90-Day Inhalation Toxicity, Prenatal Development, Bacterial Reverse Mutation Assay, *In vitro* Mammalian Cell Assay, and *In vitro* Mammalian Chromosome Aberration testing.

References

ACGIH, 1991. Documentation of the Threshold Limit Values and Biological Exposure Indices. 6th Edition. Cincinnati, OH: American Conference of Governmental Industrial Hygienists. Cited in OSHA MSDS for Triethylamine, September, 1996.

Grant, W.M. 1986. Toxicology of the Eye. 3rd Edition. Springfield, IL: Charles C. Thomas. Cited in OSHA MSDS for Triethylamine, September, 1996.

Hall, R.L. and B.L. Oser. Undated. Recent Progress in the Consideration of Flavoring Ingredients Under the Food Additives Amendment. 4. GRAS Substances. Food Technology 24(5):25-28, 30-32, 34.

Occupational Safety and Health Administration (OSHA). 2008. Occupational Safety and Health Guideline for Trimethylamine.
http://www.osha.gov/SLTC/healthguidelines/trimethylamine/recognition.html

TOXNET, 2008. http://toxnet.nlm.nih.gov